REMARKS

The present application was filed on September 17, 1999 with claims 1 through 22. Claims 1 through 22 are presently pending in the above-identified patent application.

In the Office Action, the Examiner rejected claims 1-22 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

The present invention is directed to a terrestrial repeater for use in a satellite transmission system that may also include a plurality of satellites. The OFDM terrestrial repeaters differentially encode the transmitted signal over frequency, as opposed to time, in order to avoid channel phase distortion.

Information Disclosure Statement

An Information Disclosure Statement is submitted herewith to submit papers that were incorporated by reference in the original specification.

Section 112 Rejections

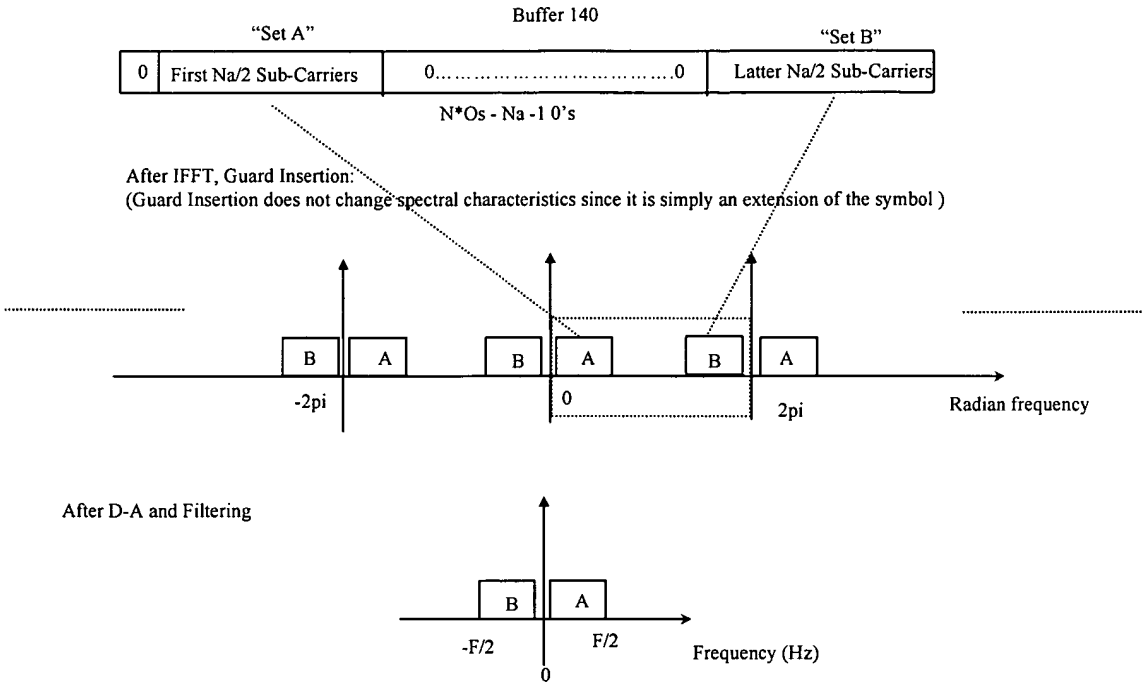
Claims 1-22 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner asserts that the original specification fails to teach for "analog signal is centered at a desired carrier frequency" as recited in amended claims 1 and 7, or "transformed signal is centered at a desired carrier frequency" as recited in claim 13, or "recovered signal is centered at a desired carrier frequency" as recited in claim 18. The Examiner further asserts that the text cited on page 9, line 21, to page 11, line 2, does not teach such subject matter.

Applicants maintain that the cited text supports the amendments of the Amendment and Response to Office Action dated June 14, 2004. Independent claim 1, for example, requires differentially encoding said signal in the frequency domain using adjacent sub-carriers to produce differentially encoded symbols; storing said differentially encoded symbols and one or more pilot tones in an IFFT buffer to produce an analog signal centered at a desired carrier frequency; and transforming said analog signal to create said OFDM signal.

Applicants note that documents incorporated by reference in the present disclosure, namely, W.Y. Zou and Y. Wu, "COFDM - An Overview," IEEE Trans. Broadcasting, Vol. 41, No. 1,

1-8 (March 1995) and J.A.C. Bingham, "Multicarrier Modulation for Data Transmission: An Idea Whose Time Has Come," IEEE Comm., 5-14 (May 1990), are representative of what was known to those skilled in the art at the time of the invention. Based on these documents, a person of ordinary skill in the art would have known to perform a digital-to-analog operation on the data in the IFFT buffer following the IFFT, but prior to transmission. (See, for example, FIG. 1 of "COFDM – An Overview.") Also, based on these documents, a person of ordinary skill in the art would recognize that the configuration of the data in the IFFT buffer, as disclosed in the present invention, would inherently produce an analog signal centered at a desired carrier frequency following the analog-to-digital operation, as described below.

Applicants note that the contents of the IFFT buffer represent the OFDM symbols in the frequency domain. The cited text discloses that differentially encoded and frequency interleaved symbols (all "z's" on page 10, lines 10-13) and pilot tones t_0 and t_{489} (page 8, lines 6-17) are stored in the IFFT buffer (page 7, line 27, to page 11, line 21). In radian frequency, the 0^{th} bin corresponds to 0 radians, and the last bin (bin number 2047) represents 2pi radians. After the IFFT, the time domain representation of the symbol is obtained. Once the digital to analog conversion is achieved, the 0^{th} bin will correspond to the first carrier located at 0 hz, and the 2047^{th} bin will correspond to 2047*4000 Hz. It is well known, however, that a digital signal replicates itself every 2pi radians. Thus, after an analog-to-digital operation, and the filtering operation achieved by the analog-to-digital operation, the transmitted data will be the replica of the signal that is closest to the 0 Hz location, and will be *symmetrically located around that frequency.* Thus, the buffering, the subsequent IFFT, and the analog-to-digital operation will transmit a plurality of tones such that the 0^{th} subcarrier will contain the null, the First Na subcarriers to the right of the null (i.e., the positive frequencies) will be located from 0 Hz to F/2, and the latter Na sub-carriers will be located from –F/2 to 0 Hz.



Thus, the subject matter of the claim limitations cited by the Examiner are supported in the original specification.

All of the pending claims, i.e., claims 1 through 22, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

Respectfully submitted,

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